

Woodbury Junior/Senior High RGO Final Report

1. Goal/Purpose of Investigation

- Acceleration Cart - This experiment is designed to observe of objects with different masses being accelerated by a fixed force in reduced gravity.
 - The following is the student hypotheses for the Acceleration Cart experiment: If two objects with different masses are accelerated with the same force, in a reduced gravity environment, then they will experience the same acceleration.
- Inertia Bars - This experiment is designed to observe the motion (oscillation) of objects of different masses exposed to a fixed force.
 - The following are the student hypotheses for this experiment:
 1. If an object is at rest in a reduced gravity environment then it will not need a force to start it in motion or stop it once it is in motion.
 2. The number of oscillations made by three inertia bars will be the same regardless of their mass in a reduced gravity environment

2. Investigation Results/Data

- The acceleration carts of the same weight accelerated the same within a reasonable amount of error during both ground and reduced gravity tests. However, different weights produced different accelerations in each environment. Reduced gravity tests were done both vertically and horizontally to illustrate the acceleration consistency.
- The oscillation bars oscillated consistently in both the ground and reduced gravity tests. The oscillations varied by weight in each environment. The bars in reduced gravity did need a force to start them in motion, our hand, and did need a force to stop them, air resistance and friction.

3. Investigation Conclusion

- Reduced Gravity does not effect acceleration or oscillations of a body.
- Newton's Laws were proven.

4. Lessons Learned From the Experience

- Back-up plan in the event of equipment failure. NASA to help.
- Much more difficult to complete the project.
- Hard to coordinate over a long period of time.
- Send press release material much sooner.

5. Outreach Events Performed/Planned (A simple list.)

- NASA family night presentation.
- Staff faculty meeting demonstration.
- Professional Development provided by NJ Department of Education titled "It's about Inspiring Not Inquiring" that uses the reduced gravity experiment as the foundation and model for what science instruction can and should look like in N.J.
- Experiment and data posted to the N.J. Dept. of Education's teacher resource page for other teachers to access.
- Newspaper to run an article on the final outcome when complete.
- New Jersey Network email follow-up.
- Did they send us the press release for the RGO?

6. Student Educational Outcomes of Participation in This Program

- Careers.
- Better understanding of the relationship between science and technology.
- Exposure to an authentic hands-on project.
- Basic examples of Newton's Laws.

7. What evidence will be collected to assess educational impact on the students?

- Greater interest level.
- Because of the delay, most of the original students moved on.
- New students completed writing assessments about what they learned through witnessing the experiments.
- Students learned about the history of NASA mission patches and designed their own patch for our RGO mission.

8. Teacher or Community Outcomes of Participation in This Program

- Due to the public outreach, community members became aware of the great experience in which their children participate.
- As the lead teacher, Mike learned a tremendous amount of engineering and physics, enabling him to pass on the learning experience to others. As well as putting together state-wide competitions and larger state wide initiative.
- We enjoyed a large community turn-out for our NASA family night where we showed the RGO DVD and further explored Newton's Laws.